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Birdsfoot Trefoil for in Iowa

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let's answer these questions about . . . .

Birdsfoot Trefoil in Iowa

by H. D. Hughes, J. M. Scholl and Virgil Hawk

IS BIRDSFOOT TREFOIL a new legume?

When we use the terms "birdsfoot" or "trefoil" in Iowa, we mean broadleafed birdsfoot trefoil—a relatively new legume in the United States and even newer in Iowa. In Europe it's an old legume. Reference was made to it by agricultural writers in Europe as long as 175 years ago.

● How long has it been grown here?

This legume came to this country by accident—no one knows just when. It spread along New York highways and into meadows and pastures where farmers discovered the value of this stranger for both pasture and hay. It became the subject of intensive study by New York agricultural workers in 1934.

The first known seedings of birdsfoot trefoil in Iowa were made in 1938, one near Atlantic and the other near Centerville. The Atlantic seeding was with timothy for hay, while the Centerville seeding was with bluegrass for pasture. Both fields have continued through a 13-year period with a good grass-legume balance. On the Pasture Improvement Farm near Albia, seedings made in 1941 and 1942 in pasture renovation studies continue with a thick, vigorous stand and growth.

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● What does it look like?

Trefoil is a leafy, fine-stemmed, perennial legume usually growing to a height of 20 to 40 inches. Old plants may have 50 to 100 stems from a single crown. The pea-like flowers are larger than those of alfalfa or clover with four to eight flowers to a cluster. Flowers are from bright orange-yellow to lemon-yellow in color and are attractive to honeybees. Flowers are self-sterile, and for seed production cross pollination must be done by bees and other insects.

● How does it differ from alfalfa?

Flowers are larger, and the stems are much finer. The crop may lodge badly unless the plants are supported by a grass growth with them. Plants develop a strong, deep root, though not as deep as that of alfalfa. Trefoil is drouth- and heat-tolerant as is alfalfa. It has the same high protein content and palatability as alfalfa.

● Is it adaptable to our soils?

Trefoil has wide soil tolerance. It grows under conditions of wide variations in soil acidity, fertility and moisture. Although this legume has acquired a special reputation for maintaining itself and producing on the less fertile soils, it makes higher yields on more productive soils or when properly fertilized.

● Is liming recommended?

Trefoil will make a good growth on distinctly acid soil—soils on which alfalfa and sweetclover don't succeed and where red clover does poorly. Considering long-time returns, however, application of lime to correct acidity is recommended.

● Does it respond to phosphates?

It has been particularly responsive to phosphate fertilizer on several Iowa soils. Application of 200 to 300 pounds of 20-percent superphosphate or its equivalent is advised on most soils that need phosphorus. But soil tests can tell you more accurately what should be applied. We've found that top-dressing trefoil pastures with phosphate early each spring or every other year is profitable in most instances.

● What is chief use in Iowa?

Trefoil has proved to be of particular value in Iowa and other Corn Belt states as a permanent pasture legume. Once established in permanent pastures, this perennial legume may be expected to continue almost indefinitely—growing in proper balance with the grass and increasing the acre value of the pasture. Trefoil is a little slow in becoming established. So it's not recommended for pastures to be left down only 2 or 3 years.

● What does renovation with trefoil cost?

Trefoil is a long-lived perennial practically as permanent as the grass with which it's grown. So renovation costs should be distributed over a period of years. When the cost is distributed over the first 10 years, the annual per acre cost should be about $5—and that includes all costs. At Albia the costs were like this: Machine operations

and labor (shallow plowing, disking, seeding, rolling, etc.), $7.45; materials (including heavy applications of lime and phosphate at seeding time, trefoil and orchardgrass seed), $32.95. Top-dressing with superphosphate (totalling 600 pounds during a 10-year period) would cost about $9.60 or 96 cents per year.

• Should trefoil be used for hay?

In Iowa when hay shortages result from stand failures on rotation hay lands, it may be necessary to harvest trefoil for hay. Thus trefoil hay may be produced from improved permanent pasture surpluses. High-quality hay may be harvested even after the seed pods appear.

However, the important use of trefoil in Iowa is as a permanent pasture legume; alfalfa and red clover are preferred for hay.

• Are there different kinds and varieties?

The name birdsfoot trefoil is sometimes applied to three different species—broadleafed trefoil, narrowleafed trefoil and big trefoil, all perennials. Big trefoil isn't winterhardy in the Corn Belt, and narrowleafed trefoil is less productive than broadleafed trefoil. So in Iowa, "trefoil" means broadleafed trefoil.

Large amounts of trefoil seed are coming in from Europe, especially from France and Italy. These types are about 10 days earlier in maturity than our domestic strains. In some tests, the imported strains haven't been fully winterhardy. But until domestic seed supplies become adequate, it may be necessary to use some imported seed.

• When is the best time to seed?

Best time to seed is in early spring at the time most grass and clover seedings are made. Most late summer seedings haven't been successful—probably due to the fact that the seedlings start off with a rather slow, weak growth.

• What is the recommended rate of seeding?

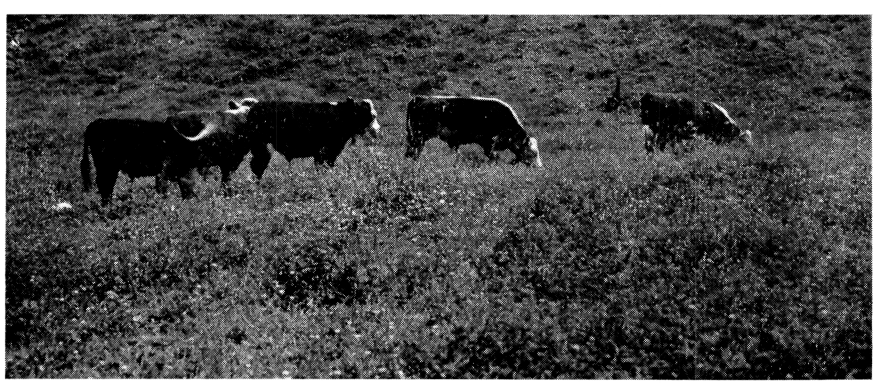
It's generally agreed that there's no advantage in using more than 4 or 5 pounds of seed per acre. The general recommendation is that no other legume be seeded with trefoil since the trefoil seedlings start rather slowly, are small and can't stand severe competition. In our tests we've seeded about 3 pounds of red clover with 4 pounds of trefoil with oats. The red clover and oats provide pasture while the trefoil is becoming established. But with this mixture it's important that the red clover and oats be kept grazed off in order not to crowd and smother the starting trefoil.

• What is the best grass to grow with trefoil?

We now rank Kentucky bluegrass first, orchardgrass second, timothy third and bromegrass fourth. It's fortunate that trefoil and bluegrass grow so well together since bluegrass predominates in Iowa permanent pastures.

• Is it necessary to inoculate?

Yes! The bacteria that form nodules on the common legumes of the Corn Belt don't form nodules on trefoil roots. So trefoil must be inoculated with a special trefoil culture. Using soil from around the roots of well-nodulated plants is an effective way to inoculate trefoil seed for small plantings.



Birdsfoot trefoil has proved to be of particular value in Iowa and other Corn Belt states as a permanent pasture legume. Though not recommended for rotation pastures, this perennial legume may be expected to continue almost indefinitely in permanent pastures.

• Where can trefoil seed be obtained?

Nearly all seed companies and seed dealers now handle trefoil seed—both the New York certified and that imported from Europe. And it's often possible to buy seed produced locally. In 1950 a total of 10,000 pounds of seed was produced in 20 Iowa counties.

• What are trefoil's strongest features?

Its strong points are: wide soil tolerance, heat and drouth tolerance, winter-hardiness, high nutritive value and palatability, potential high production per acre, free seeding habit, permanence when once established, suitability for growing with bluegrass and other commonly grown Corn Belt grasses, and its non-bloating characteristic. Its chief value under Iowa conditions is as a permanent pasture legume.

• What are its limitations?

Seedlings are small and weak and can't stand severe competition when becoming established. The seeds shatter readily during harvest, resulting in high seed costs. A special inoculant is necessary. It's slow in coming into maximum production and, as a result, isn't well suited to use in rotation seedings.

• How do you renovate a pasture with trefoil?

Shallow plow the pasture on contour in late fall or early spring, preferably after liming. Complete seedbed preparation in the spring with a disk or field cultivator. Work phosphate fertilizer into the soil during these operations or drill it in with oats. Drill or disk in 1½ to 2 bushels of oats and firm the surface with a packer seeder or corrugated roller.

Broadcast inoculated trefoil seed on the surface at the rate of 4 to 5 pounds per acre along with 3 pounds of red clover. (Firm the surface again and cover seed using a corrugated roller.) It's important that the oats and red clover be kept grazed to keep competition for light, moisture and nutrients at a minimum.

Three to four pounds of timothy can sometimes be seeded to advantage with the trefoil and red clover —Kentucky bluegrass being depended upon to volunteer. Don't use timothy in a mixture that may be harvested for seed.